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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,446	03/04/2004	CHIH-HSIANG YANG	11584-US-PA	2445

31561 7590 09/12/2006

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER

PIZIALI, JEFFREY J

ART UNIT	PAPER NUMBER
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2629

DATE MAILED: 09/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/708,446

Applicant(s)

YANG, CHIH-HSIANG

Examiner

Jeff Piziali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☒ Claim(s) 1 and 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The abstract of the disclosure is objected to because lines 5-6 of the Abstract should be changed from, "*signal transmitter, so as to generate a differential signal and propagate which to next stage*" to "*signal transmitters, so as to generate a differential signal and propagate **the** differential signal to **the** next stage.*" Correction is required. See MPEP § 608.01(b).
3. The disclosure is objected to because of the following informalities: The written description on the whole lacks proper grammatical articles preceding many nouns. For instance: Page 1, Paragraph 5 of the specification should be changed from, "*The driving circuit for a liquid crystal display (LCD) in conventional scheme is primarily categorized into parallel driving circuit and cascade driving circuit. A parallel driving circuit transmits data signal to designate driving circuit unit via bus, thus it takes substantially large layout and routing area on a printed circuit board*" to "*The driving circuit for a liquid crystal display (LCD) in a conventional scheme is primarily categorized into **a** parallel driving circuit and a cascade driving circuit. A parallel driving circuit transmits **a** data signal to designate **a** driving circuit unit via **a** bus, thus it takes **a***

substantially large layout and routing area on a printed circuit board." Appropriate correction is required.

4. The specification has not been checked to the extent necessary to determine the presence of all possible missing articles throughout the specification; and an artisan would understand the general gist of what the application is attempting to express. However, the applicant is respectfully requested to inspect the specification for additional missing articles, and to make the necessary grammatical corrections accordingly. Applicant's cooperation is requested in correcting any other errors of which applicant may become aware in the specification as well.

5. The disclosure is objected to because of the following informalities: Page 2, paragraph 6, last 3 lines should be changed from "*Therefore, cascade style driving circuit is developed upon pursuing miniature in electronic products*" to the slightly less clunky "*Therefore, a cascade style driving circuit was developed for pursuing miniaturization in electronic products.*" Appropriate correction is required.

6. The disclosure is objected to because of the following informalities: Page 3, paragraph 8, line 7 should be changed from "*transmits which*" to "*transmits the cascade signal.*" Appropriate correction is required.

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7. The disclosure is objected to because of the following informalities: Page 7, paragraph 29, lines 5-6 should be changed from "*transistor 520 where an output signal 522 is drawn*" to "*transistor 540 where an output signal 522 is drawn.*" Appropriate correction is required.

8. The disclosure is objected to because of the following informalities: Page 9, paragraph 32, line 18 should be changed from "*swtemptempitches*" to "*switches.*" Appropriate correction is required.

Claim Objections

9. Claim 1 is objected to because of the following informalities:

Claim 1, lines 6-7 should be changed from "*transmitting which to a next stage of the driving circuit unit*" to "*transmitting the differential signal to a next stage of the driving circuit units.*"

Claim 1, lines 10-11 should be changed from "*receiving differential signal*" to "*receiving a differential signal.*"

Claim 1, line 12 should be changed from "*driving circuit being*" to "*driving circuit units being.*"

Appropriate correction is required.

10. Claim 4 is objected to because of the following informalities:

Claim 4, line 27 should be changed from "*turned of*" to "*turned off.*"

Claim 4, lines 26-29 describes "*not performing amplification*" when "*the first sensor switch and the third sensor switch are turned [off], and the second sensor switch and the fourth sensor switch are turned on.*" However, the specification discloses different switch settings for "*non-partial amplification*" -- wherein the first sensor switch [Fig. 8; 830] and the fourth sensor switch [Fig. 8; 860] are turned on, and the second sensor switch [Fig. 8; 840] and the third sensor switch [Fig. 8; 850] are turned off. The applicant is respectfully requested to correct either the specification or the claim language, so that non-amplification switch settings are clearly disclosed.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Pai (US 2004/0075636 A1).

Regarding claim 1, Pai discloses a cascade liquid crystal display driving circuit (see Page 1, Paragraph 17, Lines 1-2), comprising: a plurality of driving circuit units [Fig. 3; 34A & 34B], coupling in cascade fashion, for outputting a data signal [Fig. 3; S11-S1384 & S21-S2384] to drive a LCD [Fig. 3; 36]; a plurality of differential transmitters [Fig. 3; 348A & 348B], for

generating a differential signal and transmitting which to a next stage [Fig. 3; 34B] of the driving circuit units, each of the driving circuit units being disposed with one of the differential transmitters; and a plurality of differential receivers [Fig. 3; 344A & 344B], for receiving a differential signal from a previous stage [Fig. 3; 34A] of the driving circuit units, each of the driving circuit units being disposed with one of the differential receivers (see Pages 1-2, Paragraphs 17-19).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pai (US 2004/0075636 A1) in view of Chow (US 6,836,149 B2).

Regarding claim 2, Pai does not expressly disclose manufacturing the differential transmitter with any particular kind of transistor structure.

However, Chow discloses a differential signal transmitter [Fig. 4; 400] comprising: a current source [Fig. 4; 404], for providing current that is required by the differential signal transmitter; and a first transistor [Fig. 4; 406], a second transistor [Fig. 4; 408], a third transistor [Fig. 4; 410], and a fourth transistor [Fig. 4; 412], wherein a drain of the first transistor and a drain of the second transistor are coupled to the current source, a source of the first transistor is coupled to a drain of the third transistor where a first signal [Fig. 4; 416] is drawn, a source of

the second transistor is coupled to a drain of the fourth transistor where a second signal [Fig. 4; 418] is drawn, sources of the third and the fourth transistors are coupled [Fig. 4; 422] to ground voltage [Fig. 4; gnd], and the first signal associated with the second signal is the differential signal (see Column 4, Lines 6-24).

Pai and Chow are analogous art, because they are from the shared inventive field of differential signal transmitters making use of reduced swing differential signaling and mini-low voltage differential signaling (see Pai: Page 2, Paragraph 17, Lines 6-8 and Chow: Column 2, Lines 35-37). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use Chow's differential transmitter structure to make Pai's differential transmitter within each driving circuit unit, so as to provide a standardized differential data transmission interface and pathway (see Chow: Column 1, Lines 27-38).

15. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pai (US 2004/0075636 A1) in view of Sunohara (US 2003/0038771 A1).

Regarding claim 3, Pai discloses the differential signal transmitter comprises a signal amplifier [Fig. 3; 346AB], which converts (from digital to analog) and partially amplifies the differential signal (see Page 2, Paragraph 18, Lines 10-13) after the differential signal is transmitted from the differential signal transmitter (see Page 2, Paragraph 20).

Pai does not expressly disclose amplifying the differential signal between each stage of the cascaded driving circuit units. However, Sunohara discloses amplifying [Fig. 7; 31] and converting [Fig. 7; 32] a differential signal [Fig. 7; d0-dn] between each stage [Fig. 7; 30] of plural cascaded driving circuit units [Fig. 8A; 30-1 to 30-6], wherein the amplification and

conversion occurs before the differential signal is transmitted from a differential signal transmitter [Fig. 7; 32] to the next stage (see Pages 7-8, Paragraph 52).

Pai and Sunohara are analogous art, because they are from the shared inventive field of cascaded differential signal transmitters and receivers for driving a liquid crystal display panel. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use Sunohara's differential signal amplification and conversion technique between each stage of Pai's driving circuit units, so as to stably transmit data with high reliability (see Sunohara: Page 8, Paragraph 54, Lines 8-14).

16. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pai (US 2004/0075636 A1) and Sunohara (US 2003/0038771 A1) as applied to claim 3 above, and further in view of Matsuura (US 5,619,169 A).

Regarding claim 4, neither Pai nor Sunohara expressly discloses manufacturing an amplifier with any particular kind of transistor structure.

However, Matsuura discloses an amplifier [Fig. 1] comprising: a first current source [Fig. 1; 4a] and a second current source [Fig. 1; 4b]; a first resistor [Fig. 1; 3] and a second resistor [Fig. 1; 3'], a second terminal of the first resistor and a second terminal of the second resistor are coupled to ground voltage [Fig. 1; 5]; and a first sensor switch [Fig. 1; 2a], a second sensor switch [Fig. 1; 2a'], a third sensor switch [Fig. 1; 2b], and fourth sensor switch [Fig. 1; 2b'], a first terminal of the first sensor switch [Fig. 1; 2a] and a first terminal of the second sensor switch [Fig. 1; 2a'] are coupled to the first current source [Fig. 1; 4a], a first terminal of the third sensor switch [Fig. 1; 2b] and a first terminal of the fourth sensor switch [Fig. 1; 2b'] are coupled

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to the second current source [Fig. 1; 4b], a second terminal of the first sensor switch [Fig. 1; 2a] and a second terminal of the third sensor switch [Fig. 1; 2b] are coupled to a first terminal of the first resistor [Fig. 1; 3] where a first signal [Fig. 1; 6'] is drawn, a second terminal of the second sensor switch [Fig. 1; 2a'] and a second terminal of the fourth sensor [Fig. 1; 2b'] switch are coupled to the a first terminal of the second resistor [Fig. 1; 3'] where a second signal [Fig. 1; 6] is drawn, the first signal associated with the second signal is the differential signal that is amplified (see Column 4, Lines 45-58), wherein if performing amplification, the first sensor switch [Fig. 1; 2a] and the third sensor switch [Fig. 1; 2b] are turned on [Fig. 1; via 1 set at H level], and the second sensor switch [Fig. 1; 2a'] and the fourth sensor switch [Fig. 1; 2b'] are turned off [Fig. 1; via 1' set at L level], and if not performing amplification, the first sensor switch [Fig. 1; 2a] and the third sensor switch [Fig. 1; 2b] are turned off [Fig. 1; via 1 set at L level], and the second sensor switch [Fig. 1; 2a'] and the fourth sensor switch [Fig. 1; 2b'] are turned on [Fig. 1; via 1' set at H level] (see Column 6, Line 53 - Column 7, Line 5).

Pai, Sunohara, and Matsuura are analogous art, because they are all from the shared inventive field of differential signal processing circuitry. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to use Matsuura's differential amplifier structure with Sunohara and Pai's combined cascaded differentially-amplified driving circuitry, so as to provide a high speed amplitude variable type differential amplifier capable of having a large and variable range of output amplitude (see Matsuura: Column 3, Lines 46-48).

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tobita (US 2004/0252116 A1), Maeda et al (US 2003/0156086 A1), Sakaguchi et al (US 7,075,505 B2), Pickering et al (US 7,027,522 B2), You (US 6,946,804 B2), Mouret et al (US 6,906,588 B2), Renous (US 6,703,898 B2), Imajo et al (US 6,697,040 B2), Lou (US 6,639,457 B1), Hattori (US 6,593,801 B1), Huijsing et al (US 6,559,720 B1), Ogawa et al (US 6,236,393 B1), and Sanwo et al (US 5,684,429 A) are cited to further evidence the state of the art pertaining to cascading liquid crystal display driving circuits.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Piziali whose telephone number is (571) 272-7678. The examiner can normally be reached on Monday - Friday (6:30AM - 3PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571) 272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Jeff Piziali', with a stylized, cursive script.

Jeff Piziali
5 September 2006